MODIS Data Production

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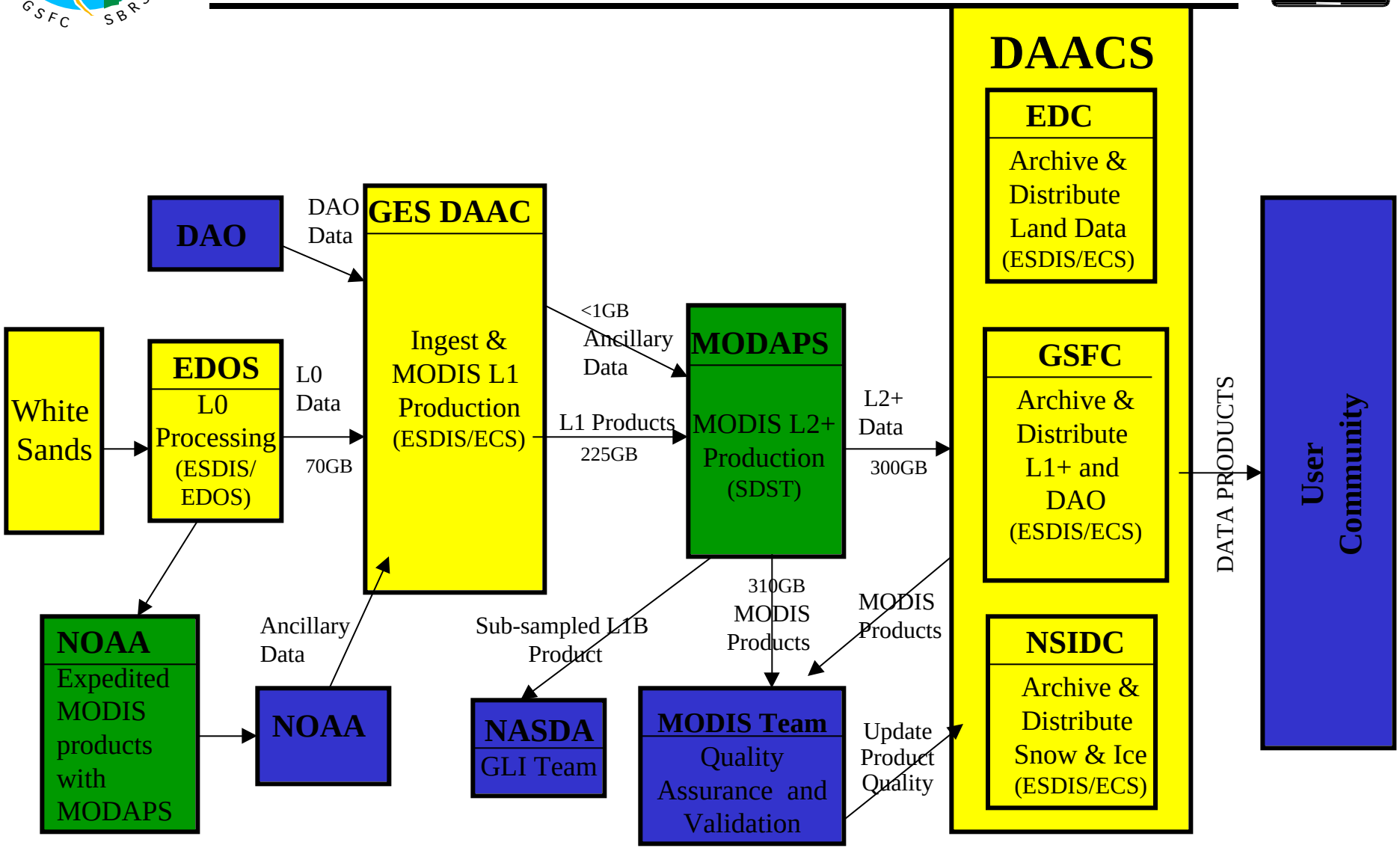
MODIS Data Product Flow



Production Status: MODIS

- EDOS working well, reorders of L0 by GDAAC are ~1%
- GDAAC processing Terra at 2X on SGI Origin 2000s
  - GDAAC production expected to reach 3X with addition of remaining Aqua h/w (upgraded SGI Power Challenges)
  - Install S4P on Origin to support reprocessing
- MODAPS shipping 300GB/day to DAACs, production is below 2X for 2/96 baseline
  - V2 MODAPS s/w + FY01 cpu's are not yet installed
- 150TB of Terra MODIS products have been archived at the GSFC, EDC and NSIDC DAACs from 2/25/00-12/31/00
  - 2/96 baseline volume would have been 170TB if all products were archived starting 2/25/00

	May, 2000	September, 2000	January, 2001	May, 2001 (planned)
Hardware on the floor	**32 195 MHz Processors in SGI Challenges**		**- 32 (24 for MODIS processing) 400 MHz Processors in SGI Origin - 40 195 MHz Processors in SGI Challenges**	
Rated Processor Throughput	**2 X**	**2 X**	**3.2 X - Origin (Challenges added by early April)**	**3.2 X - Origin 2.4 X - Challenges**
I/O efficiency (percent)	**55**	**60**	**65 (untested estimate with new hardware)**	**65 (assumed)**
Rated Throughput	**1.1 X**	**1.2 X**	**2.1 X**	**2.1 X 1.6 X**
Average Downtime (percent)	**25**	**10**	**7**	**4 (Estimated) (Scheduled downtime)**
Actual Throughput	**.82 X**	**1.1 X**	**~ 2 X (estimated for Origin)**	**> 3 X (estimated for Origin and Challenges)**

Production Status MODAPS

- Most PGEs run at or below 12/97 Reber-Barron estimate
- MODAPS ships 300GB/day (~1.3x 2/96 baseline) of L2+ products to DAACs
  - Funded requirement is 460GB/day(2X 2/96 volumes)
  - **MODIS goal is 950/day (2X 1/01 volumes)**
  - V2 MODAPS s/w + new h/w are needed to reach goal
- Up to 400GB/day are shipped to SCFs and associated facilities via network and DLT
  - Baseline is ~50GB/day
  - Have assumed that Q/A volume will not significantly increase with reprocessing

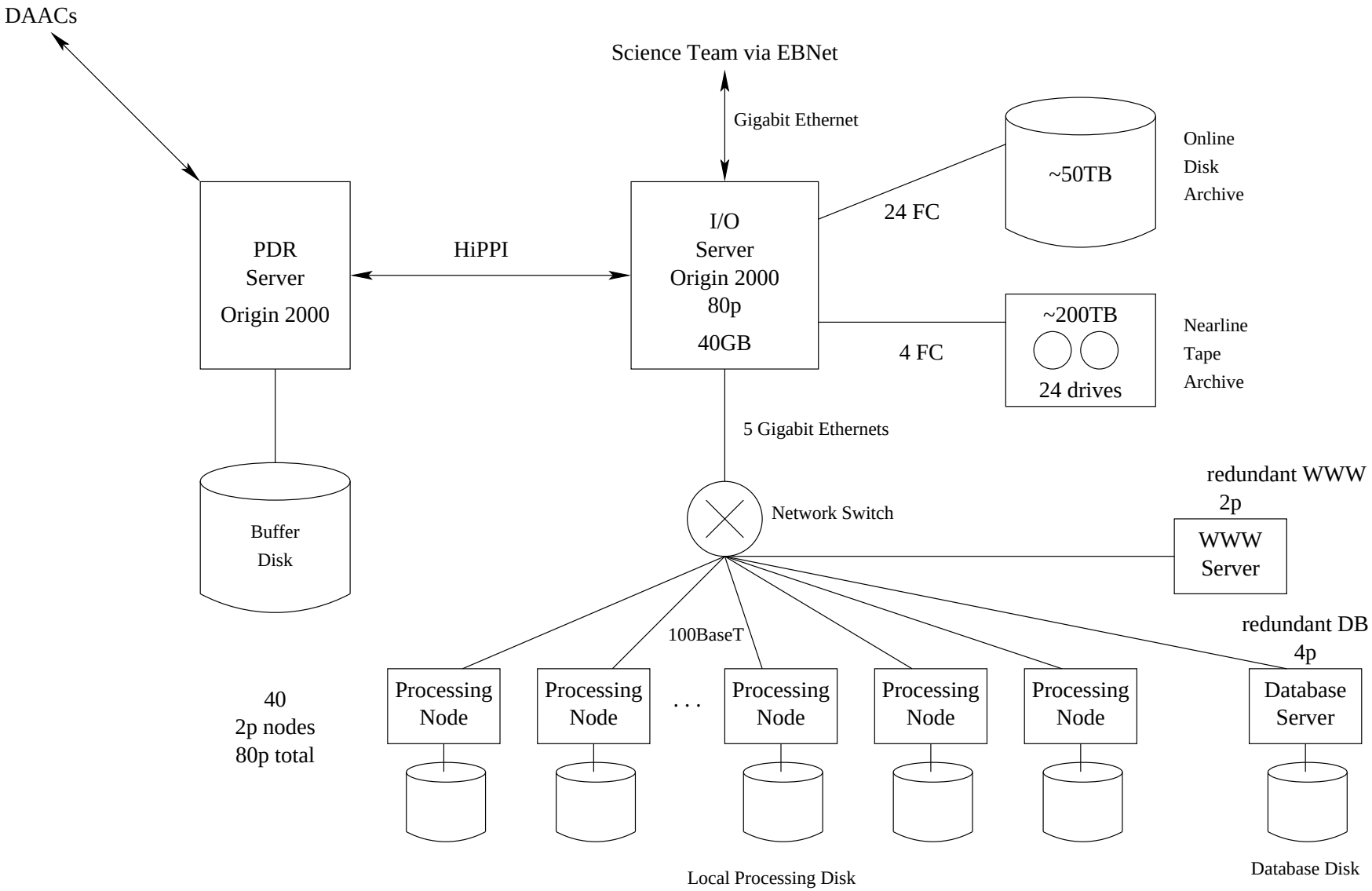
Performance Improvement with V2

- V1 single file system slows production
  - Elapsed time for PGEs (V1 production vs. V2 test):
    - PGE06 (1 granule): V1=27min V2=16min 1.7X faster
    - PGE11 (1 orbit): V1=116min V2=51min 2.3X faster
    - PGE12 (1 tile): V1=4min V2=1min 4X faster
  - V2 also speeds up retrieves from and stores to tape, 1Mbps -> 5Mbps per drive
- Fewer deadlocks in database (better export, ingest and archive performance)

Product Volumes (Ingest, Archive)

	2/96 Archive GB/day	Barron Archive GB/day	FY01 Ingest GB/day	FY01 Archive GB/day	FY03 Ingest GB/day	FY03 Archive GB/day
GDAAC	434	428	193	420	229	456
EDC	154	228	267	228	328	283
NSIDC	16	13	14	14	40	40
L0-L4	605	669	473	661	598	779
L2-L4	229	383	473	435	598	553

MODAPS



01/23/2001

Hardware Status

- SGI Origin 2000 production system
  - 80 R10K processors 250Mhz
  - 9TB MetaStor RAID operational
  - 7TB DataDirect RAID operational (5TB for L1 buffer)
  - ***7TB DataDirect RAID, waiting on power on 1/29***
  - ***45TB DataDirect RAID ordered***
- Separate database and WWW servers with V2
- Linux production servers: 16 installed, ***64 ordered***
- 1 scalar AIT-2 tape library operational, ***2nd ordered***
- Network operational for production
  - Improved bandwidth needed for Q/A (LDOPE)

Remaining Work

- 1/29 Finish installation of power
- 2/8 Finish installation of disk and tape
- 2/28 Finish installation of V2 MODAPS with current PGEs
- 3/1 Start shadow processing in V2 (.25x-1x)
  - Full ingest of L1 inputs, processing limited to spatial (Safari) or temporal subsets (global oceans for a week)
- 3/30 Switch to V2 for full production
- 5/31-6/31 Additional cpu's delivered
- 6/15-7/15 Additional cpu's in production

Science Team Help

- Porting PGE's to Pentium processors under Linux
  - L2 through L3 Daily
  - Resources are available on Linux cluster
  - Mike Linda has a useful guide
  - PGE's 4,7,8 and 60 are done, PGE 6 is being ported then will turn to PGE's 9 and 10
- Remaining Terra+Aqua-ready PGEs needed
- Expect start-up problems moving to V2, intense period of bug-fixes during transition to production